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OF THE

AN
INAUGURAL DISSERTATION
ON THE
SUPPOSED POWER
OF THE
UTERUS,

SUBMITTED TO THE CONSIDERATION OF

THE

HON. ROBERT SMITH, PROVOST,

AND OF

THE REGENTS,

OF THE UNIVERSITY OF MARYLAND.



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AN INAUGURAL DISSERTATION, &c.

THE Supreme Being in his munificence has allotted capacities to man sufficient to exalt him to a high state of excellence. But although many men of genius have thrown much light on the pages of science, and have illuminated the intellectual world, still much remains to be discovered.

When grasping after great objects men too often overlook those which are smaller but are equally important : while the aspiring mind pursues with success its favourite and exalted objects, other important matters are left for improvement by minds whose claims are no higher than mediocrity.

Perhaps nothing has so much checked improvement in Medical Science, as the toleration of that indolence and pliability of mind which subjects our mental operations, like our apparel, to the controul of fashion—the medical world has been successively modelled by an Hippocrates, a Stall, a Boerhaave, a Hoffman, a Brown, a Cullen, &c.

It is clear, upon the whole, that Medicine has been gradually receiving some improvement ; it is equally clear that it is susceptible of further improvement.—While we are surprised at the boldness of some modern Physiological speculations concerning the uses of the Spleen, Liver and Thymus Gland, and at the proposition for expediting parturition, by subduing and weakening the powers of the mother, it is equally sur-

prising that those lively imaginations have overlooked a matter of fact, much more important in a practical point of view, viz : that the gravid uterus possesses no expelling powers.

To demonstrate this position shall be the business of this dissertation.

Before I proceed to give my reasons in support of the above doctrine, I shall bring to the reader's recollection the opinions of some of the best writers on Midwifery and Anatomy.

Denman, page 149—" It was by later writers supposed that the child was expelled by the uterus, aided by that of the diaphragm and abdominal muscles. This doctrine, which I believe was first advocated by Fabricius ab Aquapendente, is the basis of all modern improvements in the practice of midwifery ; and it is so indisputably proved, by the occurrences both in natural and difficult labours, that its truth is now almost universally admitted." We might be ready to suppose the Doctor was near the truth in this matter did we not find him in the next page, and many other parts of his work, supporting the old doctrine of the uterine powers. In page 150, he says, " there is, first, a gradual subsidence of the fundus of the uterus and whole abdomen, so that women often appear, and really are less in the ninth month than in the eighth month of pregnancy. This is a good indication, because it shews that the fundus and all other parts of the uterus are disposed to act ; and on the equality of this disposition the efficacy of its action much depends. When there is none, or but little subsidence of the abdomen, and the patient complains, even in time of labour, that the child is very high, it is always unfavourable ; being a proof that the fundus of the uterus is in an inactive state, or acting im-

properly.” This although perhaps true as a matter of fact, goes for to prove the Doctor’s opinion of the uterus being the principal agent in effecting delivery.

Doctor Burns on the gravid uterus, page 174—
 “The course of the muscular fibres is of very little consequence to the accoucheur ; but it is of the utmost importance that he should be well acquainted with their action. Naturally, the uterus remains torpid, and like a membranous bag, until the end of the ninth month. At this time, it begins to act, contracting a little in every point, but especially at the fundus. By degrees, this contraction increases, and, along with it, the pain ; but the action is very imperfect, and does not tend immediately to expulsion ; for the os uteri contracts at the same time with the rest of the uterus, whilst it dilates, in true labour. This we know by introducing the finger. Very soon, however, a more perfect contraction takes place in the fundus and body, whilst the os uteri gradually relaxes and dilates.”—This is taking much pains to give powers to the uterus very complex, to wit, a contraction at one end in proportion to the relaxation at the other ; powers also, which we hope to prove are unnecessary, inasmuch as the abdominal muscles are fully competent to the task of expelling the fœtus.

Baudelocque’s Midwifery, page 98—“The uterus, very sensible and very irritable, in common with all muscles, enjoys two modes of action—a tonic action, or elasticity, which is equal and constant ; and a spasmodic contraction, which is sudden and momentary.—By the former, when it is distended, it constantly endeavours to restore itself to its original state ;—but it is by the latter that it acquires the force necessary to overcome the obstacles to that restoration, and to deliver itself of the bodies which encumber and incom-

mode it. The tonic action of the uterus, or its elasticity, subsides after death, and seems to continue as long as the heat of the subject. The expulsion of the fœtus and its dependencies, after the death of the woman, seems to confirm this truth; and it is likewise proved by the contraction of the uterus, which takes place as quickly and strongly as after the most common labour, when we extract its contents at the instant life ceases. If we have a right to conclude, from these observations, that the tonic actions of the uterus continue some time after the cessation of life, experience equally proves that it may be so weak after delivery as to appear in some measure destroyed.”—With respect to delivery subsequent to the death of the woman, I will only remind the reader in this place that Baudelocque in his extensive practice met with no case, and is careful in a note to observe, that he is not willing to be responsible for the cases related by authors. That there exists so strong an action or contractibility in the uterus after death, as this great accoucheur seems disposed to believe, I think extremely doubtful, and I shall relate a case by and by, which goes far to prove the contrary. We might go on to mention the opinions of Hamilton, Smellie, and I believe every other writer on Midwifery, in support of the old doctrine of the uterus being the principal expelling organ.

Denman, who unquestionably is the best writer on our subject, both as it respects theory, practice, and instruments, glances at certain auxiliary powers of the system in effecting delivery.—Page 164, “In a few cases, I have known the action of the abdominal muscles so regular and strong, that the whole volume of the uterus has been heaved up and down alternately, in such a manner, that it was scarcely possible to distinguish

between this strange succussion and the proper action of the uterus." Having given the opinion of other writers on Midwifery on the uterine functions, we will now give the opinion of John and Charles Bell.

First volume John Bell, page 192—"Thus the alternate yielding and reaction of the abdominal muscles and diaphragm performs breathing; agitates the bowels; promotes the circulation; expels the fæces and urine; assists the womb in the delivery of the child." Volume 2d page 84, on respiration, Mr. Bell says, "The support of the great blood vessels, the compression of the viscera, the expulsion of the urine and fæces, the ridding of the womb of its burthen; all could have been performed by the pressure of the abdominal muscles alone! the diaphragm is added merely for breathing."—Charles Bell, vol. 3d, p. 174, "The orifice continuing to dilate, and the efforts of the womb increasing, the membranes burst, and the head of the child presses on the orifice; then the womb is allowed to contract; this contraction is a stimulus to greater efforts, and in a few pains the head descends into the cavity of the pelvis."—Thus we find, upon the whole, that in this highly respectable anatomical work, the old doctrine is continued. John Bell seems to admit it as a possible thing, that the abdominal muscles might effect a delivery. In the winter 1810 and 11, Professor Davidge taught his class that the abdominal muscles are the principal agents in ridding the gravid uterus of its burthen, which was ably illustrated, and we believe, considered as well established by the whole class. In the succeeding winter Professor Hall taught the same doctrine, viz: that the uterus is principally unburthened by the action of the abdominal muscles. Thus far we consider the new doctrine as fully received and supported by those gentle-

men. I hope to extend it still further, and maintain, that the uterus has no more contractile power than is necessary for reducing its own volume when emptied. In support of this position, I will first mention a fact now universally admitted, viz : the extremely vascular structure of the gravid uterus. Baudelocque and others refer to Mr. Cruikshank for the anatomy of this organ. Is it reasonable, that in proportion as the uterus approaches to the time at which it is to be brought into vigorous action, it becomes more and more disqualified to act?

If we admit the uterus to be a hollow muscle, and very vascular, as spoken of by every writer, can we suppose that a tissue of blood vessels and lymphaticks are calculated to give strength to muscular action ? On the contrary, I am of opinion, that this fact alone is sufficient to shew that the womb is not designed to perform the office of a muscle. Secondly, the diversity of opinion respecting the muscular fibres of the uterus, together with sufficient examination of its anatomy prove, that although there may be a few external fibres, there is no muscularity in its walls, and that it is an organ of peculiar organization, and that organization giving it elastic powers merely sufficient to bring it, after delivery, to its proper state ; and I do not believe its elasticity sufficient to reduce its size, but that this is in a great measure effected by the abstraction of blood from the numerous blood vessels in its substance, and finally, by the absorbents of the part.—Thirdly, nature ever surprising us more by the simplicity with which she accomplishes her purposes, than by the complexity of her means, would here, according to the old opinion, present us with functions which would certainly be unnecessary. But a few years ago we had the lungs, according to

physiologists, playing themselves like bellows, although it was evident they had no muscularity sufficient to enable them to perform such office. Now we see a diaphragm and intercostal muscles sufficient to accomplish the whole active process of respiration in man and many other animals, while the lungs are merely designed for the due preparation of the blood. We see the abdominal muscles ever ready to protrude the intestines, &c. through any interstices which may accidentally be formed between the muscles, and thus producing a variety of herniæ. We see the abdominal muscles competent to the expelling the fœces, and even the rectum itself?—Does any one imagine that the intestines possess the power to propel their contents through the sphincter ani?

We see the abdominal muscles brought in as the sole agents for emptying the urinary bladder.

Now, if we find the abdominal muscles and diaphragm sufficient to perform the offices above related, why allege that they stand in need of this extraordinary power of the uterus to assist in parturition?

Fourthly. It will no doubt be admitted that the uterus is nearly surrounded by the abdominal muscles, and that they act powerfully at least in assisting the uterus. How are we to conceive of two layers of muscular fibres wholly unconnected in their origins and insertions, acting in such unison as not to interrupt each other, if the abdominal muscles act powerfully on the most prominent part of the uterus, how can the uterine fibres act equally? Will not those under strong pressure be disabled, and act in disproportion to those that are more free?

If the womb have such a strong disposition to contract, how comes it that its walls do not press together in proportion to the resistance the child gives, seeing

that when situated in its water, it presents an irregularly dense surface to the uterine walls? What disposition of fibres can act in such a manner as to prevent the soft parts from yielding, and causing the fœtus to be imbraced according to the parts it presented?

That the uterus from disease takes on an unequal contractile power sufficient to oppose an obstacle to delivery, more especially of the placenta, we admit—but the mere gathering up is a very different thing from that prodigious force which is necessary in labour; an action calling for more muscular energy than any to which the female frame can be subjected. If the uterus possessed the power usually attributed to it, the waters must in every case be evacuated so soon as the os tin-
cæ was dilated, from the cause above assigned; but the abdominal muscles, having their origins and insertion, and whole arrangement, so as to embrace regularly and especially on the most prominent parts, cannot operate on the most yielding parts.

Fifthly. I am disposed to doubt whether any contractile power remains in the uterus longer than any other part possessing any action during life. Some years since I was called to the case of Mary Wingler, of Shippensburg, Pennsylvania, who had been upwards of two weeks in labour, with her third or fourth child, after an interval of six years since her last. As I entered the room the woman was dying with the fœtus low down in the pelvis. Before I could have my forceps brought a few hundred yards she was dead. One of the attendants thought she felt the child struggle as the woman expired. I obtained leave to open the body, and this was done in less than five minutes after death. The fœtus, as I now should expect, was dead. The uterus lay in close contact with the abdominal muscles,

the former being tense with the extravasation of blood which filled its cavity. The accumulation of blood was amazingly great. On cutting through the walls of the uterus much dark blood was discharged, and this viscus was flaccid. After being cut it shewed no disposition to contract.

I am well aware how unfavourably some persons view cases when related in support of doctrines, but unless we can obtain the confidence of mankind in almost all matters of fact, it would be in vain to attempt argument.

If we have even to admit that the fœtus has been expelled after the death of the mother, I do not see why we are to ascribe it to powers belonging to the uterus. Certainly, this is a very rare occurrence, and ought when admitted, to be attributed to a combination of circumstances with which we are not well acquainted. To what powers are we to ascribe the alvine discharges, or those from the mouth after death? Do we not find the abdominal muscles always tense, soon after death, whether the cavity be distended by the enlargement of some viscus, or lessened from wasting disease? Do we not see that some hours after death, the whole muscular system is tense, whether the body be swollen or lean? To this I presume there is no exception—the time however at which it takes place varies considerably. Tension in muscular matter implies contraction. I will suppose a woman in labour whose form is well adapted to admit of easy and expeditious delivery, and on the very point of being delivered, seized with Eclampsia, and life extinguished as we sometimes find almost in an instant. Or, we may suppose, a parturient woman whose pelvic cavity is so large as to impede her delivery to be destroyed suddenly by flooding, when the fœ-

is nearly expelled. Now, in either of those cases, and these are the most probable circumstances under which a woman could be destroyed whose form would admit of delivery after death, the contraction of the abdominal muscles would be the most efficient means for expelling the child. That the abdominal muscles do contract powerfully, at least in some cases after death, is a fact beyond controversy, and I am happy in having it in my power to give a case which fully established the position I have taken. In the year 1802, I was called to Peter Beymer, Lancaster County, Pennsylvania, who was labouring under ascites. I went prepared to tap him. On a full examination of his case I thought his strength sufficient to enable him to undergo the operation. I accordingly went on to have the necessary bandages prepared, there being but one room in the house we were obliged to be constantly before him.— He was very uneasy and seemed considerably alarmed, got out of bed, and just as we had finished the bandages, &c. threw himself back in his chair and expired without a struggle. After the corpse was dressed, some of his friends suggested that as I was prepared to operate it would be a matter of convenience as it respected the coffin to draw off the water. I made a perforation with my stilette and drew off a considerable quantity of water without any pressure being applied to the abdomen. At first it flowed freely. I presume no case could be more unfavourable than this for leaving a power of contraction in the muscles, they having been distended for several weeks, and that from disease which I would expect to destroy their tone, to a much greater degree than the gradual and natural distention of the abdomen from pregnancy.

I hope no one will be disposed to doubt this case, because it is given to support the doctrine which I am advocating. I am too sensible of the infamy which ought to attach to those who endeavour to mislead by misrepresentation.*

Sixthly. If the uterus contracted so powerfully on the child enveloped in its membranes, what is it prevents the whole uterus and contents from being expelled together, seeing that in proportion as labour advances the action of the abdominal muscles increases? Is there any adhesion? Any anatomical structure to prevent such an accident? Where has the gravid uterus its fastenings? Is it not merely supported by the pelvis, abdominal muscles, &c. ? I believe the uterus has no security from frequent accidents of this kind, but its yielding to the powerful action of the muscles, and consequently not disposed to glide down. The yielding of the water in the early stage, and the uneven surface of the fœtus in the advanced stage, will cause the uterus to fold or relax, and thereby to occupy every space about it. The prominences of the great psoæ muscles may have a considerable effect in preventing the uterus from being forced down. The os pubis may also have a large share in this provision of safety to the uterus.—Whatever may be the action by which delivery is accomplished, I am well satisfied that on mechanical principles the result or functions which I have attributed to the different organs, would take place. I am sensible with what caution we should attribute phenomena of the living system to mechanical principles. But there

* The fate of a Chisholm should be a lesson to those who undertake to state matters of fact, if their own sense of honour and honesty is not sufficient to controul their conduct. For the unfortunate error alluded to, see a statement given by Mr. Ecker, in the Philadelphia Museum.

are some parts of the animal system which the living principal causes to operate purely on mechanical principles. We see the tendinous pulley of the eye through which the superior oblique muscle plays. We see the *perferatus* and *perferans* of the fingers ; the *atlas* and *dentatus* in the *vertebræ* of the neck ; the arrangement of the bones of the fore arm suit to the performance of a variety of motions almost endless, and many other mechanical contrivances might be pointed out.

Seventhly. It has been alleged that the action of the uterus has been sufficient to rupture or lacerate its own walls. Can we believe that any muscle (granting for a moment the womb to be a muscle) has sufficient energy to lacerate its body? It may be said that the *tendo achilles* has been torn by muscular action, but this is no objection to my position, because no part of the uterus is tendinous. I believe it would be easy to prove that the uterus is seldom, if ever torn, except at its neck, the part least supported by the abdominal muscles, and that no muscle is ever torn by its own action. The uterus is also more liable to be ruptured at its neck, from being strongly pressed against the inner edge of the *os pubis*, which goes far to prove that the abdominal muscles force the uterus powerfully against that part. This accident raises a strong presumption that the uterus has no extraordinary power of contraction, and that when lacerated, it is from the powerful efforts of the abdominal muscles, acting on it too forcibly for its strength, or taking it in an unfavourable position. *Accoucheurs* talk of the hand being caught and cramped by the uterus—I believe if they were to attribute it to the abdominal muscles, they would be much nearer the truth. I do not hesitate to give it as my opinion that if

the uterus did not yield in some measure in every powerful pain, it would be liable to be propelled with the fœtus in many cases. Authors admit that the uterus has been protruded with its contents. This accident must arise from rigidity of the uterine walls, or from an uncommon size of the pelvic apertures. The rigidity alluded to, may arise from the pains of parturition not coming on so soon as the laws for the evolution of the uterus are suspended, or from extraordinary strength of the membranes. For if my opinion be correct, the membranes must give way at a certain time, or if the pelvic aperture be of good size, and the abdominal muscles vigorous, this accident may occur.

Eighthly. Those who have suffered the pains of parturition tell me on putting the question fairly, that they are not sensible of any extraordinary action in the region of the uterus; but that they rid themselves of the child by efforts similar to those by which other evacuations are made from the abdomen. Some of them that they are not sensible of any pain except in the back, &c. Being limited to the narrow bounds of a Theses, I must rest my arguments here, believing every mind entirely divested of prejudice, will be satisfied of the truth of the doctrine advocated. The sum of the doctrine which I am contending for is, that the uterus has no contractile power by which parturition is accomplished. That the fundus is the part first distended by the ovum; this distension extends gradually downwards through the corpus and cervix uteri by regular laws of growth. When the cervix has been distended, this law ceases to operate, and the fœtus, &c. continuing to enlarge the cervix becomes painful from distension. The consequence of this distension of fibres, or opening of the cervix, excites the abdominal muscles into action. The mus-

cles coming to press very forcibly on the uterus and its contents, expels the fœtus, while the uterus during this process serves no other purpose but to resist the powerful action of the muscles as a mere membranous bag would. And I believe it would be nearly equal, whether the fœtus lay in the rectum, bladder, or uterus, if the health was good we do not believe the mother would perish undelivered. A viscus so very vascular as the uterus, is well suited to the purpose of giving nourishment to the germ, &c. but that very arrangement which suits it to the phenomenon of growth completely disqualifies it from vigorous contraction, nor is such a power necessary, the abdominal muscles being wonderfully adapted to that purpose. That bloodletting judiciously practised may be beneficial in some cases of parturition is unquestionable, and was well known to the excellent Denman and others; but if our doctrine be admitted, we should be very cautious how we reduce the strength of our patients. This caution cannot be too strongly impressed on the minds of young practitioners. I expect to pursue this subject at a future day, and explain several parts of our subject, which will now appear in a different light, if my foregoing opinion be correct. I cannot take my leave of this subject, without expressing my regret that Baudelocque's system of Midwifery, should have obtained a preference in the United States. The work of Denman is much neglected. I do not wish to detract from the celebrity of Baudelocque, but a prolix system, tedious detail, and perplexing division of labors; his long and clumsy forceps, and useless plate of pelvi meters, compared with the learned and practical Denman, will ever I hope secure a preference for the latter, with all who judge honestly for themselves.

My father and preceptor in medicine, having long since gone through the shades of death, I am deprived of the pleasure of presenting my warmest thanks for his paternal cares, and for his early attention in directing my mind even in its infancy to medical pursuits.

The Professors of the Medical College will please to accept my sincere thanks for their attention to myself, and their zealous endeavours for the instruction of their class. That the institution over which they preside may flourish, and medical science take on a new æra honourable to them and beneficial to our blessed Country, is the fervent prayer of their humble servant,

THE AUTHOR.

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